

## CLAIMS

We claim:

1. A modified carbon black dispersion, which is a liquid having dispersed therein a modified carbon black obtained by subjecting a carbon black raw material powder to oxidation treatment, and is characterized in that the modified carbon black has on the surface thereof (a) carboxyl groups, and (b) lactone groups in a molar amount of at least 500  $\mu\text{mol/g}$  relative to the weight of the modified carbon black and a molar ratio of 0.8 to 1.1 times the amount of the carboxyl groups.
2. The modified carbon black dispersion according to claim 1, characterized in that the molar amount of the carboxyl groups is at least 700  $\mu\text{mol/g}$  relative to the weight of the modified carbon black.
3. The modified carbon black dispersion according to claim 2, characterized in that the mean particle diameter of the modified carbon black is 150 to 250 nm.
4. The modified carbon black dispersion according to any one of claims 1 through 3, characterized in that the carbon black raw material powder already has on the surface thereof carboxyl groups, and lactone groups in a molar amount of at least 20  $\mu\text{mol/g}$  relative to the weight of the carbon black raw material powder and a molar ratio of 0.65 to 1.1 times the amount of the carboxyl groups.
5. The modified carbon black dispersion according to any one of claims 1 through 4, characterized in that the carbon black raw material powder has a primary particle diameter of 11 to 18 nm, a BET specific surface area of at least 180

m<sup>2</sup>/g, and a DBP oil absorption of at least 180 mL/100g.

6. The modified carbon black dispersion according to any one of claims 1 through 5, characterized in that the carbon black raw material powder is subjected to the oxidation treatment using a hypohalous acid and/or a hypohalite.

7. The modified carbon black dispersion according to claim 6, characterized in that the carbon black raw material powder is subjected to the oxidation treatment using a hypohalous acid and/or a hypohalite having a chlorine amount relative to the surface area of the carbon black raw material powder of  $0.6 \times 10^{-4}$  to  $1.5 \times 10^{-4}$  mol/m<sup>2</sup>.

8. The modified carbon black dispersion according to any one of claims 1 through 7, characterized in that the percentage change in the mean particle diameter of the modified carbon black upon 5 weeks elapsing at 70°C is not more than 15%.

9. The modified carbon black dispersion according to any one of claims 1 through 8, characterized in that the percentage change in the viscosity upon 5 weeks elapsing at 70°C is not more than 10%.

10. The modified carbon black dispersion according to any one of claims 1 through 9, characterized in that after the oxidation treatment, the liquid obtained is subjected to desalinization, thus making the electrical conductivity of the modified carbon black contained therein be not more than 0.7 mS/cm.

11. A water-based ink, characterized by containing the modified carbon black dispersion according to any one of claims 1 through 10.

12. The water-based ink according to claim 11, characterized in that the settling rate of the modified carbon black is not more than 30%.

13. The water-based ink according to claim 11 or 12, characterized by having a penetrability such that the penetration time upon applying the ink onto a recording medium in an amount of 1 mg/cm<sup>2</sup> is less than 1 second.

14. The water-based ink according to any one of claims 11 through 13, characterized by having a surface tension at 20°C of not more than 45 mN/m.

15. The water-based ink according to any one of claims 11 through 14, characterized by containing a glycol butyl ether type water-soluble organic solvent.

16. The water-based ink according to any one of claims 11 through 15, characterized by containing a nonionic surfactant.

17. The water-based ink according to claim 16, characterized in that the nonionic surfactant is an acetylene glycol type surfactant.

18. A recording method, characterized by carrying out recording on a recording medium by attaching the water-based ink according to any one of claims 11 through 17.

19. The recording method according to claim 18, characterized by being an ink jet recording method comprising carrying out printing by ejecting droplets of the water-based ink and attaching the droplets onto the recording medium.

5 20. A recorded article obtained by carrying out recording using the recording method according to claim 18 or 19.